

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A computer-implemented system that facilitates determining presence of an object a Universal Plug and Play (UPnP) device in a computing network, comprising:
 - a transmit component that transmits a multicast-type M-SEARCH verb that is sent message as a unicast message to the object a specific UPnP device within the network such that the M-SEARCH request is made to function as an Internet Control Message Protocol (ICMP) ping operation, the object UPnP device having a timeout period and a plurality of functions capable of independent presence indication associated therewith, the multicast-type M-SEARCH verb being message directed to a first set of one or more of the plurality of functions, the multicast-type message is M-SEARCH verb being of a type that is normally sent as a multicast datagram to discover multiple UPnP devices;
 - a presence component that monitors a response to the unicast message from the object UPnP device, the response comprising a directed search response even though the UPnP device is configured to treat the M-SEARCH verb as if it was a broadcast M-SEARCH request broadcast to all UPnP devices in the network, and if a response is not received, the object UPnP device is presumed to be off-line with respect to the first set of one or more of the plurality of functions, wherein the object UPnP device is presumed to be on-line with respect to a second set of one or more of the plurality of functions, and wherein the response is similar to that for a multicast message to the object UPnP device;
 - and a processor configured to execute the transmit and presence components.
2. (Currently Amended) The system of claim 1, the object UPnP device is at least one of a wired device, a wireless device, and a service.
3. (Currently Amended) The system of claim 1, the multicast-type message M-SEARCH verb is transmitted in unicast at least once before the timeout period expires.

4. (Currently Amended) The system of claim 1, a plurality of the multicast-type messages M-SEARCH verbs are transmitted in unicast to the object UPnP device to control the object UPnP device.

5. (Currently Amended) The system of claim 4, the plurality of multicast-type messages M-SEARCH verbs signal the object UPnP device to stay online.

6. (Currently Amended) The system of claim 1, at least one of the transmit component and the presence component is part of a client application that transmits the multicast-type message M-SEARCH verb in unicast and receives the response in unicast from the object UPnP device.

7. (Cancelled)

8. (Original) The system of claim 1, the unicast response is cached at the system-end.

9. (Currently Amended) The system of claim 1, the multicast-type message M-SEARCH verb is directed to at least one of the object UPnP devices, an embedded device of the object UPnP device, and an embedded service of the object UPnP device.

10. (Cancelled)

11. (Currently Amended) The system of claim 1, the object UPnP device is compatible with a plug-and-play architecture.

12. (Currently Amended) The system of claim 1, the transmit component transmits a plurality of unique multicast-type messages M-SEARCH verbs in unicast to a respective plurality of the objects UPnP devices.

13. (Currently Amended) The system of claim 1, the transmit component transmits a first multicast-type message M-SEARCH verb in unicast to an intermediate device to determine its status before transmitting the multicast-type message M-SEARCH verb in unicast to the object UPnP device.

14. (Currently Amended) The system of claim 1, the multicast-type message M-SEARCH verb is transmitted in unicast to the object UPnP device from a first client application, the response to which indicates a status of the object UPnP device, and the status of which is announced by the first client application to a second client application.

15. (Cancelled)

16. (Original) A computer readable medium having stored thereon computer executable instructions for carrying out the system of claim 1.

17-25. (Cancelled)

26. (Currently Amended) A computer-implemented method of determining the presence of a[[n]] object UPnP device on a network, comprising:

transmitting from a computer a multicast-type M-SEARCH verb that is sent message in unicast to the object on demand a specific UPnP device within the network such that the M-SEARCH request is made to function as an Internet Control Message Protocol (ICMP) ping operation, the object UPnP device having a timeout period and a plurality of functions capable of independent presence indication associated therewith, the multicast-type M-SEARCH verb being directed to a first set of one or more of the plurality of functions, the multicast-type M-SEARCH verb being of a type that is normally sent as a multicast datagram to discover multiple UPnP devices;

checking for receipt by the computer of a response from the object UPnP device to determine the status of the object UPnP device, the response comprising a directed search response even though the UPnP device is configured to treat the M-SEARCH verb as if it was a broadcast M-SEARCH request broadcast to all UPnP devices in the network, and if a response is not received, the UPnP device is presumed to be off-line with respect to the first set of one or more of the plurality of functions, wherein the UPnP device is presumed to be on-line with respect to a second set of one or more of the plurality of functions, and wherein the response is similar to that for a multicast message to the UPnP device; and

determining the status of the object UPnP device based upon receipt or non-receipt of the response.

27. (Currently Amended) The method of claim 26, further comprising delaying determination of the status of the object UPnP device until a predetermined number of additional multicast-type messages M-SEARCH verbs have been transmitted to the object UPnP device in unicast.

28. (Currently Amended) The method of claim 26, further comprising initiating discovery of an intermediary object UPnP device in response to determining initially that the object UPnP device is off-line.

29. (Currently Amended) The method of claim 26, further comprising automatically initiating discovery of a redundant object UPnP device in response to determining that the object UPnP device is off-line.

30. (Currently Amended) The method of claim 26, the object UPnP device is one of a plurality of interdependent objects UPnP devices such that failure of the object UPnP device results in failure of the remaining plurality of interdependent objects UPnP devices.

31. (Currently Amended) The method of claim 30, plurality of interdependent objects UPnP devices are discovered according to a hierarchy such that the object UPnP device is discovered before the remaining plurality of interdependent objects UPnP devices.

32. (Currently Amended) The method of claim 26, further comprising signaling the object UPnP device to stay on-line using at least two of the multicast-type messages M-SEARCH verbs sent in unicast to the object UPnP device.

33-36. (Cancelled)